Amendments to the Claims:

1. (Currently amended) A method of synthesizing a repertoire of oligonucleotide tags, each having a predetermined length in the range of from 18 to 60 nucleotides, the method comprising the steps of:

(a) providing a repertoire of same-length oligonucleotide tag precursors in an amplicon, wherein said amplicon is a cloning vector, and wherein each oligonucleotide tag precursor consists of one or more words, and each word is an oligonucleotide having a length of three to fourteen nucleotides, selected from a minimally cross-hybridizing set of oligonucleotides, such that a duplex consisting of a word of the set and the complement of any other word of the set contains a number of mismatches that is either 1, 2 or 3 less than the length, in nucleotides, of the word;

(b) cleaving a first aliquot of the amplicon to produce a first opened amplicon and a first fragment, said fragment containing at most one word from said oligonucleotide tag precursor;

(c) cleaving a second aliquot of the amplicon to produce a second opened amplicon and a second fragment, said fragment containing one or more words from said oligonucleotide tag precursor;

(d) ligating said second fragment containing one or more words into said first opened amplicon, thereby elongating said oligonucleotide tag precursors in said first aliquot of the amplicon;

(e) amplifying the elongated oligonucleotide tag precursors in said first aliquot of the amplicon; and

(f) repeating steps (b) through (e) until a repertoire of oligonucleotide tags having the predetermined length is formed.

2. (Cancelled)

3. (Previously presented) The method of claim 1, wherein each said step of cleaving includes cleaving said amplicon in a region adjacent to said word, using a type IIs restriction endonuclease.

4. (Previously presented) The method of claim 1, wherein each said word has a length in the range of from four to six nucleotides and is constructed from nucleotides selected from A, C, G, and T, or wherein each said word has a length in the range of from four to eight nucleotides and is constructed from three nucleotides selected from A, C, G, and T.

5. (Cancelled)

6. (Previously presented) The method of claim 1, wherein each said step of cleaving includes cleaving said amplicon at the upstream and downstream boundaries of a word, using a type IIs restriction endonuclease.

7. (Previously presented) The method of claim 1, wherein each said word has a length of four nucleotides and wherein said oligonucleotide tag has a length in the range of from 18 to 40 nucleotides.

8-14. (Cancelled)

15. (Currently amended) A repertoire of oligonucleotide tags of the form:

$$w_1(N)_{x1}w_2(N)_{x2} \ldots (N)_{xn-1}w_n$$

wherein

each of w_1 through w_n is a word consisting of an oligonucleotide having a length from three to fourteen nucleotides and being selected from a minimally cross hybridizing set, wherein a word of the set and a complement of any other word of the set has a number of mismatches that is either 1, 2 or 3 less than the length of the word, <u>said words being constructed from three of the four natural nucleotides</u>;

N is a nucleotide;

each of x_1 through x_{n-1} is an integer selected from the group consisting of 0, 1, and 2, provided that at least one of x_1 through x_{n-1} is 1 or 2; and

n is an integer in the range of from 4 to 10.

16. (Currently amended) The repertoire of claim 15, wherein said length of <u>each</u> said word is from four to ten nucleotides.